Milt Reeves

I'm Milt Reeves. Most people know me by that but Milt happens to be my middle name. My name is really Henry M. but I prefer Milt and it's a pleasure here to be here this morning and talk about, hopefully a little bit about the old days of the waterfowl surveys and other waterfowl matters but I've been retired since 1983 from the Fish and Wildlife Service and I suppose that makes me an old timer but I really don't think of myself in that respect nor as a pioneer in, in the north American waterfowl program because so many other people did so much way, way ahead of anything I may have done but I, I guess I should start something about my resume. I was raised in New Jersey and I don't tell many people that but now all of you folks know that and after World War II serving a little time in the Navy and with the advent of the GI bill I decided to go to school as a forester. I was always very much interested in hunting and particularly waterfowl hunting but I had no idea that there's such a thing as a collage degree in wildlife. So, I thought well, the next best thing probably is to become a forest ranger of some sort and schools are extremely difficult to get into in those days after World War II because everyone had the same objective I did, to get a college degree and hopefully find some experience after that, that would be worthwhile. So, I applied for a number of schools and I ended up being accepted first at Utah State University at that time it was Utah State agricultural college and while I was in the Navy I had a good friend from Utah and he talked about the beauty of Utah many, many times and I'd never been there but what I had the choice of choosing

between the schools I thought gee, why not give Utah state a try and so I did and I had an old 1935 Chevy that I just overhauled the engine on and took off with a few possessions to Logan, Utah and I'll never forget coming up over the summit there between Brigham City and Logan and looking out over cash valley, I thought what a beautiful, beautiful place this is and it's always been one of my very favorite places, the setting of Logan in the Cash valley and the school campus, absolutely beautiful but anyway after entering school there I soon found that, well, my gosh you know, you don't have to be a forest ranger because we offer wildlife management degrees and I was just absolutely elated and so I switched my major from, from forestry into school of or department of wildlife and at that time Jeff Slow, Dr. Jeff Slow is the leader of the Utah cooperative wildlife research unit and I always tried to spend as much time as I could with Jeff, he was an absolute fountainhead of knowledge about waterfowl because he'd done his PHD degree at, at Iowa state on the Red Head Duck and I just by happenstance, I couldn't have ended up I don't think at a better school as far as my personal interests were concerned and then on top of that were the Great Bear River marshes and the other fine marshes there in northern Utah so I think I had just a splendid time there, under graduate work at the Utah agricultural college and I graduated there in 1950. Well, upon finishing a degree I guess somebody feels that you aught to get out and do something worthwhile and find a job. Well, all of my friends in wildlife were going to become researchers and although I was interested in research I thought it seemed to be a sort of a narrow type of position to take upon just beginning in wildlife so I kept an open mind and

finally ended up accepting a job at the, for the Idaho department of fish and game in American Falls, Idaho in southeastern part of the state as a conservation officer. Well, the duties of a conservation officer are largely law enforcement oriented but in Idaho as did in many other states they capitalize upon their conservation officers or whatever they maybe called, these are the work people, this is the man power that's draw upon when big jobs have to be done and they're located throughout the state, they're readily available and I think most of the conservation officers even though they may be a bit law enforcement oriented primarily they enjoyed these other jobs too and so at American Falls I was able to participate in dove call count surveys and the pheasant surveys, winter deer counts, waterfowl surveys, banding waterfowl, many, many things and I've always looked back upon those days in American Falls as just a splendid, splendid background to learn what wildlife management was all about. So, I spent two years in American Falls as a conservation officer and then Bob Saughter who was the state waterfowl biologist out of Boise took me aside one day and he said you know, have you ever thought about going back and doing some graduate work and I said well, yeah it's been at the back of my mind to do that and he says you have an interest in, in waterfowl, correct? I said, absolutely, I said that's what my life revolves around the most waterfowl and wetlands. Well, he says we have, we're beginning a Pitman Roberson project in the southeastern part of the state on an area called Digham marsh. It's a sixteen thousand acre marsh at the upper end of Bear lake which straddles the border between Idaho and Utah and he said, would you consider, would you be interested in doing the

field work that we'd like to have done over there and he says perhaps you know, he said you could use that for your graduate work too and immediately I was interested in that and at first I thought about going to the University of Idaho, in fact I'd already been accepted there for graduate work but I thought gee, that's in another part, that's practically in another state and people in Idaho tell you that we have two states, one is the southern part and then there's the totally detached part up there at the north, up in the pan handle and at that time you couldn't drive through the state of Idaho to get to the north part of the state, you had to detour off on a road into Washington State and I think that probably has been corrected since but anyway on second thought I thought perhaps Logan would be the best place to go back to. I, I know the folks back there, down there, they know me, it's handy, it's close by. These instructors and Jeff Slow are more oriented in the waterfowl and wetlands then are the people in the faculty up the, up at Boscow, Idaho. So, I made plans then to, to go back down to Logan. Well, my graduate program was sort of screwy because I did my fieldwork before I did my academic work. Gee, I could, I could, I could do the field work and get down there and fuck, fuck my graduate, my course work, that thought did occur to me. But anyway the graduate school down there with a bit of reluctance said yeah, okay go ahead, do your field work and we'll take a chance with you and you're taking a chance with us and we hope you have a good academic year when you come down here to do your graduate work and finish up your dissertation, not dissertation but thesis and so I did that for two years. Marilyn and I were married them and we lived in Mount Puluer and that's in the Bear lake valley, a high

altitude, 6000 foot western valley. The winters are long, long, long and the summers are short and bitter cold and deep snows and we lived in a 20 foot trailer, 20 foot long trailer, no indoor plumbing if you understand what I mean. It was a very cold walk on a bitter cold winter day to the toilet which was about 20 yards away and we had a single kerosene stove in the trailer and we lived two years that way, two winters. Well, the marsh itself is called Digham marsh and it adjoins the Bear river which originates in Wyoming flows into, I'm sorry it originates in Utah, flows into Wyoming into Idaho and back into Utah, empties into the Great Salt Lake and in the process providing water to the Great Bear river marshes. The state wanted a overall ecological study done of the marsh, no one had worked on it much. There were a number of problems associated with it. The main one probably being that President Garfield back in the, back in the mid 1850's had granted to the Utah power and light company storage rights to use Digham marsh and also joining Bear Lake, Bear lake itself as storage for spring run off coming down the Bear river. The water was diverted through a canal into Digham marsh and of course the current flow of the water slowed there, so it deposited a great amount of silt in the marsh and then when the water was still high it was funneled off into Bear lake. Well, later in the summer the water, water problem reversed, the lake was still high, the marsh had dried up pretty much, the Bear river was way down and so the waters returned from, was thought Bear lake during exceptional years but usually the water is pumped through a pumping station there on the edge of the lake into the marsh and then flowed by gravity down the rainbow canal back into the, into the Bear river and so

as an exchange of water into the marsh, into the lake, out of the lake and into the marsh and on down the river, depending on whether it was spring or fall. Well, of course this went through great fluctuations in the water level in the marsh itself so there was a lot of concern about what this meant to waterfowl and there were a fair number of geese nesting in the marsh. Bob Saughter told me when I moved down there, if you find 100 goose nests he says, he says I just think that'd be wonderful we don't, we hope there is that many geese there. Well, I think we found, I found 125, the first year and as people suspected the geese that are nesting on elevated area, when the water comes up and it was coming up during the incubation period. These nests could very easily be flooded out and I did find a few nests flooded out that first year but by in large most of the geese got off successfully. There are a number of waterfowl, ducks that nested on the marsh also and so I did a great deal of studies, nesting studies of the waterfowl and --

Well, to make a long story short after the field work was finished and I concentrated chiefly on waterfowl production and harvest and also muskrat production and harvest and a degree was accepted and I obtained the Master's of Science degree there at Logan. I, I again had an important choice to make, go back to the state of Idaho where I had a job up at the Alfred and Cort Awayne way up in the north part of the state or maybe try something different. When in the process I met a fellow by the name of Floyd Thompson who is a game management agent and working for the Fish and Wildlife Service and he was in charge of the state of Utah and I remember he came up one day and he said, he

came over to visit our trailer and he, he said you know, what are you planning to do? And I said well, I'm not absolutely certain. Well, he said, I'd like to interest you in a job, an opportunity, he said I can't offer you the job but I could tell you of some opportunities that exist. And I said well, I'm, I'm ears what are they? Well, he said you know, because you've had law enforcement experience and with the state of Idaho two years, you qualify for a position at US game and management agent, you have to have two years of law enforcement experience and he said we have two vacancies open in the Albuquerque region which is the southwestern region of the Fish and Wildlife Service that he worked out of and he said one job is in Tulsa, Oklahoma and he said the other job is in a new station that we intend to open up in the lower route, Rio Grande valley in a place called Harlington and I said well, tell me about both areas I've been in neither. Well, he said let me tell you about Harlens in Texas and he says you may not what to hear about the, about Tulsa, Oklahoma if I understand correctly, you are interested in waterfowl. But he said Harlington is near Brownsville and he said of near there is the Great Laguna Madre, this wonderful, wonderful water, waterfowl wintering area that extents for 125 miles up the lower coast of Texas and he said this is where mostly Red head ducks in North America winter. He said we don't know how many are there but we think probably, probably three quarters of all the wintering Red heads (inaudible) in one point in the Laguna Madre of Texas. And he said, what people don't realize of course, of course are the enormous numbers of Pintails that also winter there and now, he said, in addition to the waterfowl he said, the White winged dove nests in enormous colonies in the

lower Rio Grande valley in the native brush. He said those populations have been declining because the ranchers have been cornering off the brush and we still have a lot of white wings down there, we don't know an awful lot about them. The state of Texas has a White wing biologist down there by the name of Bill Keel and we'd like you to work on white wing doves when possible and of course, he said the variety of all sorts of other migratory game birds down there but, he said, also you'd have the opportunity to go to Canada on assignments every summer and boy, if I ever had any question as to what to do which job and what my future would be or at least beginning of it, it would certainly be to take that job in Texas. So, I took the job of US Game Management Agent. The pay, the pay as I recall was $4250.00 a year and that compared with as best as I can remember $2450 or 60 dollars a year for the state of Idaho but I only got paid once a month in Idaho, got paid twice when you go to work for the Feds. So, I just bring that out at a matter of interest because money is not what drives people who work in the field of wildlife management, they work in it because they have other interests, things that are real dear to their heart. But, that may be of interest. So, we said yes, we'll take that job, after consultation with, with the better half here and so we still had the little 20 foot trailer and we had to report to work ourself, there's no, no moving expenses or anything like I understand is given routinely now for people entering on work and we hauled the 20 foot trailer down to, down to Texas and in a day or, we found a place to put it in a trailer court and in a day or two later Ed Elmore, who is the game management agent in Corpus Christi who I worked under came down to welcome us to Texas and I'd

also received a note from Larry Marafcu who was the, the chief of law enforcement out of the regional office and Larry told me that the first week of the job down there would be spent with him on orientation. So, Larry showed up shortly and he was staying in Brownsville and so I'd drive down to Brownsville to their, to Larry's hotel room and listen to Larry eight hours a day for five days. Now, if you ever met Larry Marafcu, you know what I'm talking about. But, anyway Larry is an extremely interesting fellow, very, very capable and knowledgeable and boy did he like to talk. So, he said, he opened the meeting and he says, he says this week he says, I hope to tell you everything that you need to know as a game management agent. Now, he said I want you to take, take a pad of paper and he said I want you to record this, everything I say of consequence and there were no air conditioning in those days and this was in July and extremely high humidity and it was a real ordeal. That week was one of the worst weeks I ever spent in my life and occasionally Larry would look at me and he says, he said you didn't take a note on that. He said, let me repeat what I just said. Well, we finally got through the week all right and he went back to Albuquerque and so I was left to drift there as a game management agent all on my own. Well, fortunately my office was in the San Manteo Post Office. They had arranged for that, it was in the basement again, not air conditioned of course, extremely humid but the great advantage here was that I'd be sharing the office, office space with a fellow by the name of Luther C. Goldman who was refuge manager of the Laguna Atascosa and San Ada National Wildlife refuges. Now, Luther was the son of Major E.A. Goldman who was one of the pioneer biologists

of the old Bureau of biological survey and also he was a nephew of Luther Goldman, L.J. Goldman as he's called who is the first pacific flyway biologist so here is this triumvirate of three Goldman's and I had the benefit you know, of hearing Luther tell of the experiences of his father and his uncle in the very early days of Bureau of biological survey and I'll never forget all of that and of course Luther had a, had a history of his own. Wonderful fellow, one of the, one that services the very best ornithologist and birds and Luther is right at his home town there because of all the exotic species across the border and almost all winter long he was just besieged with birders that wanted, wanted to come and visit his refuges and where might they find different scarce birds, rare birds. Well, so for summer assignments the first two years were spent in, in Western Saskatchewan north of Swift Current. In those days the survey crews always got together in Regina, we had a big kickoff meeting. Everyone reported there, they received their instructions, they received their bird bands if they were on a banding assignment, if they're on surveys they received their survey forms and instructions and everything and the great thing was, it was just not US Fish and Wildlife Service people, the bulk of those folks were Game management agents, this was the workforce at the time, a few refuge people and but also the Canadians, the wonderful group of Canadians. The Canadian wildlife service people and a lot of provincial people and people from Ducks Unlimited. Everyone who was doing work in Canada in spring would meet at Regina and it's just a wonderful opportunity for a new kid on the block like me to, to learn the people I've heard, heard so much about but it was there that I had a chance to

meet many people which later became good friends, folks like Walt Crissy and Johnny Lynch and Jerry Stout, Al Smith, among the Canadians Guser Grahamkooch, Al Exuban, Bernie Gallop and among the DU people, Bill, Bill Leach and Bob Caldwell and a number of the provincial people too. It was truly a cooperative program.

Q What year was this?

Good point. The first year up there was 1955, on assignment. I was assigned to a brand new study area in north of Swift current and this was an area that had just been set up by, a brand new area that had been set up by Walt Crissy. He'd formed the area and thought it would make a wonderful study area for two purposes. One purpose was to use it for air to ground comparison counts. In the air ground comparison count survey a, a designated area could be a lineal block of habitat or whatever would be, would be flown by the air with the, with the operational survey crew to see how many breeding ducks they would come up with, at the same time the area would be checked on the ground by a ground crew who would be ground truthing the area and between comparing the two of them there would be an air to ground visibility ratio and there could be applied to the aerial survey data in order to correct the, the aerial data because obviously a plane zipping across the county side at a hundred and some feet above the ground and at the speed of 70 or 80 miles an hour or whatever it might be, simply not time to see, opportunity to see every duck and you're hoping that do see a

representative sample of them. So, we always see far more birds on the ground doing the ground truthing then with the aerial crews and this of course still occurs today and ground surveys are still used today for that purpose so this is an idea that dates back prior to my first study up there dated back certainly into the early, early 50's for developing the air to ground comparison corrections. But the area we worked on was called the success area and people used to joke about that, you know success stud area, that's a little bit pompous isn't it calling it the success study area. Well, that was easy to explain because the only town along the transect was named success. Well, in the southeast southwestern corner, well success was a two elevator town and that needs a little explanation I think but in Canada at least in those days it used to be customary to, to identify the size of the town by their number of grain elevators it had, it be two elevator towns which really weren't much and there'd be three elevator towns which gee, now we're beginning to talk about a you know, a, a occupied part of the country where a four, four elevator town would have most of the things you would need on a daily basis and, and but we went to Swift Current and Swift Current we, we rented a house there. I was working at the time with, it doesn't come to me-- Doesn't come to me--

But, Swift Current was also a railroad center for the transcontinental railroad and also that, that year the transcontinental highway was being built across, across continent. Also, oil, oil fields had been found north west of town and so there was considerable oil drilling going on too, so Swift Current was a pretty, pretty

active town and housing was hard to find but we did, Maury Lundy and I did find a place to stay and so we worked out north of town. We worked everyday if the weather was good. Our purpose was to inventory breeding pairs of ducks on the natural wetlands, the pothole country. We were in the type of pothole country that Johnny Lynch would have called the BOP, BOP means bald open prairie. Johnny Lynch had a great language for descriptive language for things. If I might deviate a minute but anyway he called the prairie pothole region of the southern three Canadian provinces and the Dakotas, he called that area the BDF, BDF being big duck factory. North of the BDF was the BFF, that was the big fish factory and Johnny would simplify things for convenience but what, what he is telling us here was that the, the BDF, the big duck factory, this is where the, is really the heart of the waterfowl production in North America. This is where the glaciers left the potholes and marshes. It's so productive for waterfowl and although waterfowl of course breed farther north through the forested country and clear, clear to the artic and through Alaska and some of our birds even get into Siberia, the Pintails breed there but winter in, in North America. But, what Johnny was telling us here was that the, the big fish factory yes, it produces a fair number of ducks because of it's great, great extent but gee, it was really known for it's fish you know, so this is the big fish factory but anyway we were working in the bald open prairie, it's total treeless except for farm shelter builts, that the farmers put in and it was great pothole country. We had about 90 potholes per square mile and we had about that number of breeding ducks as I remember, the most common species was the Blue winged teal followed by the Mallard and

Pintail were pretty close, Gadwall and the Shoveler, those were the big birds that we worked with then. So, our purpose was to go out and inventory the ducks along this 40 mile long route which was a quarter mile wide, the same as the area flown by the aerial crews, inventory the number of ducks by species and whether they're paired or single birds or whatever and do this as often as we could and it'd take easy about three to four days to do the 42 miles and as soon as we'd finish we'd start over again and we did this about four times during the peak of the breeding season and during this time the aerial survey crews Walt Crissy usually and his observer would come in and fly the area and sometimes we'd see them and some times not but I, I mentioned that we, we did this everyday, no Saturdays off, no Sundays off, there's no overtime, there's no comp time, in fact that was generally true of the Fish and Wildlife Service in those days. We worked as long as it took to get the job done. The only reprieve would be a rainy day and it doesn't take much to put you out of commission on the prairies when it rains, a quarter of an inch can do it because those roads get greasy slick and most of them are gravel and un-paved, a paved route, road up there in those days is quite unusual. So, on a rainy day that was a day that we'd stay in town and do our laundry, we'd update our reports, correspondence, buy groceries, things to the sort.

Q Did the air crews fly these comparison areas more then once or did they just fly them once on an operational basis?

That's a good question. There were a number, a number of these air ground comparison units. There must of have been six or seven of them I guess but they flew ours more then once. They flew it several times. I, I did see the figures, I never saw what the, I never saw what the visibility ratios were --

(tape change)

A question had been raised here about overtime and everything I mentioned that we never drew it or anything so let me go back if I can to the days back in the Rio Grande Valley when I was working under Ed Elmore, US Game Management Agent, my supervisor in Corpus Christi and of course I got instructions from Ed and also during that week with Larry Marafca you know, to record everything I'd done in some detail and so I did that and well, I put down the days and the times I'd leave home to go to work, if I was leaving from home or the office or whatever and when I'd return and it was very seldom that any of these were 8 to 5 you know and this seemed to cause a problem and so I got Ed Elmore came down one time soon after that and he said you know, you know, he says the hours that you work and you report on your weekly activity reports, those are the actual hours that you work, and I said that's right. Well, he says, you work a lot more then 8 hours. And I said, well, it takes a lot more then 8 hours to get the job done you know. Well, he said, he said I want you to continue to do that. He says you are under my instructions to do that. Now, he says I've got a problem with the regional office because the regional office would like us to show only eight hours

of work per day. It needant be 8 to 5 but he says, the total hours should not be more then 8 hours and Ed says I've always disregarded that myself and he says and I, I always show actual hours working and he says, I'm your supervisor and he says, those are the instructions I have for you and so I continued to do that and finally Ed took me aside one time, and he said you know why, why I'm doing what I'm doing with, regarding my hours of work each day and I said I have no idea. Well, he says first off, he says you're automatically violating a, a Federal law by, by changing reporting hours that you are not working. He says, he says, you, you're required to show the hours, the actual hours that you do and he says that's what I do and he says what you're doing. He says no problem. But he says for some reason he thinks that the, the regional office seems to think that in time this might build a record for somebody to come back in and ask for additional pay and he, Ed said that's exactly what I intend to do after I retire. He says, I'm going to put a claim in for all the additional hours I worked and he says, it will be the test case and he said it will be very, very important and to make a long story short, Ed eventually did retire, he did file claim against the government for reimbursement of the additional hours that he worked. Well, the statute of limitations entered into the thing of course that it was only the last two or years or whatever it was that he was working that, that was subject to claim and that got to be a huge controversy and to make a long story short, Ed got a court decision in his favor for reimbursement of the hours he worked. I had no idea you know, if it's full compensation, what the rate was or anything at all like that and at his instructions I had been accumulating the same hours and everything and I, I

decided never to file. I never filed for mine but that did set in motion then some recognition that the people that were working additional hours and to if they were to perform the jobs that they were being asked to do needed, it should be justly compensated and that, I believe is how overtime first began in the Fish and Wildlife Service and haven't followed it since, I have no idea what the situation is now.

Q Continue now, you're on the breeding grounds there in Saskatchewan and running those --

Okay, yeah back to, back to the Success study area and after we'd finish up the, finish up the breeding pair surveys in May, May to about mid June, I was returned to Texas, drive back down to Texas for about a week at home, turn around and come back north to begin the work on the production surveys on the Success study area and so I said gee, I, I really don't have an awful lot I can get accomplished in Texas, there's an enormous amount of, of travel time and expense and gasoline and so forth involved and I said would there be any problem if I stayed up here? And they said well, if you do you gotta stay, you gotta take annual leave you know, we can't give you any other dispensation to do that so, anyway, I took annual leave up, stayed up there and my wife Marilyn came up and oh, we took off to Prince Albert National Park I think, and we had a wonderful camping and fishing trip up there so, back to the production survey. Well, we surveyed exactly the same wetlands following the same procedures and

everything except this time the purpose was to monitor what happened as a result of the, of the breeding of the pairs that we'd inventoried in May and June. We were counting broods and also broody like hens because lots of times you may not see the brood but you can tell by the behavior of then hen as to whether she has a brood in the nearby vegetation and this is a case where we were not really ground truthing because there is no way that we could find every single brood produced on that study area so almost all breeding ground surveys that relate to waterfowl production had that same problem. It's enormous obstacles that I'm not sure anybody's overcome yet. So, then usually about, after or during, following these surveys we'd stay in Canada and band ducks and then return back to our stations so this is just one perspective of what some of the summer work was but other people were totally engaged at waterfowl surveys, other people were full time banding, doing other things.

Q And what was happening with that information at that time? As far as the process, of setting the regulations and what was the procedure back then?

All the information went back to Patuxant into a, most of the field people I think will send it into some big black box back there because they were really not involved in the, in the processing of the data and there is a great deal of work that had to be done with, with the survey information that came in from the field and this rested chiefly in the hands of Walt Crissy. Walt at that time was the Chief Waterfowl Population person I'd guess you'd call him. He was in the

division wildlife research at that time. And it was his job to put together all the information, the breeding ground survey information, the production information, adjusting the breeding survey information for visibility factors, things like that, bringing information together in a comprehensive manner and then extrapolating or projecting it to what we knew of the area that the surveys represented, the universe represented by the survey and all that work was done back in Patuxent with, with the staff and eventually the end product would be a waterfowl status report. It'd be an evaluation of the number, of the breeding pairs of waterfowl and, and an index as to what the population was at the, at the conclusion of the production season. I, I hate to use the numbers of waterfowl because everything almost we do is really based on indices, which fall short of what the actually numbers of birds are. Then Walt was involved in carrying, carrying that information from the surveys and everything and reporting this to the Federal folks who are involved in establishing waterfowl frameworks and by frameworks I mean the out of seasons, the number of hunting days allowed, the number of ducks permitted per day, things of that sort and Walt did a fantastic job I think in pulling that information together, not that everybody agreed with him. In fact, there was a great deal of dissention and disagreement every year because people were seeing parts of the waterfowl breeding grounds that were in superb shape, they looked wonderful other parts were probably just as bad the other way and the same with the public, the public would see bits and fragments of, of wetlands habitat and wintering populations and what they don't appreciate is that what they are looking at is not representive of typical of, of the whole universe

and when we're dealing with the continental population like waterfowl that has to be our basis as to what the total population is doing. We're of course, interested in what segments of it are doing to because they have their own flyways and wintering areas.

Q What amazes me is that this is the time before computers. I mean you are having all this data that you are have to in effect write down by hand and adding machines and how long a process was that. I mean were they doing it in good time?

Well, they were doing it with the, with the old Monroe calculators, I'm answer the question about how the data was processed and in the days I've speaking of now we didn't, the Patuxent Wildlife Research center where Walt was located after he moved from the Washington office out there. There were no computers out there and, and the place was jammed full of the old Monroe calculators. I don't know if you know what I'm talking about but you'd punch this data in by hand and they were electrical and you'd crank them and they'd go (cranking noises) and they'd, it goes to a, goes to a single calculation it might take half a minute I guess, or something like that but very, very crude. Of course, no hand held calculators either. Well, I, I talked about Crissy but I should say, Walt wasn't the first one to put together information of that sort because surveys have been carried on for a long time up in the Canadian Prairies back in the '30's. biologists went up there for the bureau biological survey and did roadside surveys but nobody really knew

what they meant in terms of reflecting what was really going on up there and Fred Lincoln was probably the key individual back in those days but it was his responsibility to pull together all that information for setting regulations and so Fred Lincoln in my view, I think it did a great deal with the research he had available but he lacked the, a lot of the tools and, and manpower and everything that we had later on.

Q What drove people like that? Like Fred Lincoln and these other guys, I mean was it I mean, just scientific curiosity or was it concern that wrong information would over harvest the species? Was it the threat of lawsuits? Was it just that it has always been done? I mean I'm curious to how that leap was made to start looking at the continental waterfowl resource as, in a comprehensive year to year way?

I think there's probably two answers to that. One, is that every single one of these people that I'm talking about have an innate interest and concern about whatever resource they're working with whether it's waterfowl or morning does or whatever. They just have this driven, drive interest in a, in a species and secondly, secondly everyone of them as a character of curiosity or innovation. They want to learn about the unknown and so I say, it's dedication first and it's this deep curiosity second that drove most of these early pioneers of waterfowl management and research in North America.

Q It wasn't like a Bureaucratic mandate to come up with these numbers, I mean it sort of, they started coming up and people began I guess to see the advantages to knowing this in terms of better managing the resource.

Yeah, I think I can answer that best but George B. Saunders was one of these early people and he was the first Pacific, first flyway biologist in the central flyway and was sent into Canada in the early '30's during '34 and 5 during the dust bowl days and his instructions and they're instructions that other people like him receive read something like this that there is a problem with ducks, we have duck populations seem to be going down. We know ducks come out of the Dakotas and Canada, go up there and find out what the problem is. It's that simple and they were on their own at that point and they did the best they could with the resources they had to try to best answer that question.

Q Art Hawkins talks about when he was setting up the you know, the system of transects in Manitoba and how muddy the roads were and it must have been you know, really, I mean just the dedication of those people is what really amazes me because you're doing something that nobody can really check on you, you know and you can come back with any kind of a report, nobody's going to, going to doubt but there was a vision back then that, that really has been --

(Side B)

But they did have few advantages for example we didn't have safety meetings in those days, safety reports, well, I guess we had to fill out a safety report maybe once in a while but by in large we were pretty much free of bureaucratic paperwork which I think there's a great deal of nowadays from what I can determine. We run a different way in a given period of time we spent, able to spend a much, much higher portion of our time in, in what we thought were the important things to do.

Q Talk more about some of those early people like Lincoln and Saunders and the Goldman's and those people that, that really made a difference. Explain a little bit what the atmosphere was that nurtured those people.

Well, of course I didn't know a lot of these people and, and the few of them I did know is some cases I knew them for a year or perhaps a day. Let me, let me go back to George Saunders if I might but I was a game management in south Texas and, and I was in the office one day and this gentleman walked in and he knew Luther Goldman the refuge manager and they evidently were real close friends of course Luther introduced me and he said this is, this is George Saunders. You know, George has spent a lot of time in the Rio Grande Valley in Mexico on waterfowl and also white winged doves and everything and he said, he's just going through down here some of his records are kept out here at the refuge headquarters and so I got talking to George Saunders and I'd heard of him you know, he's a legend. But I, I, he was truly representive of this early

group of biologists. I mean he traveled all through Mexico for years under the most imaginable difficult circumstances and everything to try to inventory waterfowl and evaluate Mexican wetlands and of course this has all be published now but gosh, in a minutes Dr. Saunders said to me, to me he was Dr. Saunders, he said what are you doing tomorrow? And I said oh, I'm going out in the field and he says, he says, why don't we go out and spend a day together? Well, if I had anything planned the next day I readily forgot about it because I could think of nothing I'd rather do then spend a day with George Saunders and so I did that. I was one of the most fascinating days that I can think of and that is the only day I ever spent with George Saunders. I never saw him after that day and just recently because George Saunders died in February at the age of 93 I was asked to write his obituary for the York and I just completed that. So I hope that George Saunders and some of the things he did will be remembered perpetually. Clarence Caughtum is, is someone you read about a great deal too and of course he came out of Utah and he was chief of Welark research for Bureau of biological survey and, and also into the Fish and Wildlife Service days but Caughtum was a, was a remarkable person. He knew everything about anything, about migratory birds and he had an enormous memory. I don't think he ever forgot anything but he came down to the Rio Grande Valley one day and, and he asked (inaudible) I guess he'd been referred to me because I was the local game management agent you know, and he said, I would like to look at some white wing dove nesting colonies and the season was, that was the proper time of the season and everything and I, he was in the Washington office at the

time and I, I was just delighted you know, to be able to spend some time with him and I said well, I'd only been in the Rio Grande Valley a short while then and I didn't know the locations well of the nesting colonies but I knew some state, state officers that did and I said well, Dr. Caughtum would it be okay if we could have one of the Texas game wardens come with us tomorrow and well, he said, that'd be wonderful. He said, I'd I'd (inaudible) enjoy the day with him and so we met the night before in his motel and we talked about where we were going to go and everything and so we got down to the time well, who's car are we going to take and what time should we pick you up, Dr. Caughtum and so forth and he said well, I understand that the white winged doves in their breeding colonies begin to perform about, about 4:30 in the morning and it's getting a little light at that time (inaudible) so they are going on to their breeding behavior and everything and so he said why don't you pick me up at the hotel about 4:00 in the morning tomorrow morning. I was watching these two Texas Fish and Game officers and they were just absolutely devastated, devastated to begin a day at this, uncivilized hour of 4:00 in the morning. Well, if you know the folks in Texas you can't begin a day without two scalding hot cups of coffee to begin with and you just don't gulp two hot cups of coffee, you, you have to exchange the pleasantries of the day and everything and breakfast with Texas folks is a leisurely exercise but anyway we did meet Dr. Caughtum at 4:00 in the morning and I think he was satisfied and seen what there was to see at the breeding colonies. Of course Caughtum went on to be co-editor of the book on the white winged dove.

Q Well, continue your career from the work in Saskatchewan and being in Texas and --

Well, okay for two, so for two years in 1955 and '56 I worked on the study area there at Swift Current, okay, well, things happen on the prairies as they always do, prairies got dry, the potholes didn't have water in the, in the spring of '57, now that country only gets around 12 inches of precipitation a year. It is dry county and only under the best of circumstances do the potholes really fill up so that happened to be the situation in '57 so Crissy made the decision not to continue the success study area but we still had the big survey banding program underway, cooperative banding program and by cooperative I mean it was Fish and Wildlife Service and it was volunteers or people assigned from various Fish and Game departments, if Duck Unlimited had someone available or the provincial people. So, the crews which were 5 to 6 people represented a broad array of backgrounds and everything so anyway I was asked to lead the crew in 1957 through western Saskatchewan and the country was laid out in degree blocks of latitude and longitude and our object was to band a hundred flightless Mallards in each of these degree blocks and that's not so easily done as might sound even though you are in the heart of the duck country because circumstances have, have to be just right in order to catch any number of Mallards, particularly flightless Mallards so the crew I had as I recall was a Canadian wildlife service fellow by the name of John, I'll come up with it in a minute, a fellow from Louisiana by the name of Mort Smith and Mort eventually

ended up with the Fish and Wildlife Service as head of the aerial survey crews, same job that Jim Vozer now has and Al Cannon from the state of Ohio and Dave Harper from Illinois, out of the Canadian wildlife service fellow was John Hancock. And so we met Regina as usual, got our, we got our banding equipment and everything and took off for western Saskatchewan to begin the banding program. We had two vehicles and those were very interesting days. We worked the same schedules everyday of the week that wasn't raining and we were prepared to camp out if necessary but ordinarily we'd end up in a two elevator, no, not a two elevator because that would a two elevator town ordinarily wouldn't have a hotel but maybe a three elevator town or a four elevator town if we were lucky and almost every town had a Chinese restaurant of course in those days even, even Success had a Chinese restaurant , a two elevator town had a Chinese restaurant and the food is pretty good but whatever, so, so we worked these long hours in, in banding and trapping and the work itself was challenging because you'd try to find a pothole that had, well you could see a number of broods on it and hopefully Mallards and then try to figure out how to out smart the Mallards. If you give them half a chance they'd run up the far side and out in the prairie and be off in the pothole to the, over the hill in a, in a few seconds. They're not adverse at all to departing the pothole, other species not so much so.

Q So, you were dry trapping these birds as apposed to bait trapping?

That's right. We were dry trapping. We had equipment that we could put up very easily and so in addition to looking for a pothole that had a trappable number of bird, we were also looking for a pothole that had a configuration that would permit us to set up a trap in a strategic manner that we could catch some proportion of those bird or for example a plot of land that would go out which if you got up on one end of the pothole and you drove the, drove the birds or scared them down to the other end then you'd walk around and come back and drive them hopefully into the trap you'd set in the right place. Well, it doesn't work quite like that but quite often you would catch large numbers of birds but other times it be score, ducks would have score ten and our crew would have zero. Don't ever underestimate the, the wisdom of a Mallard. So, then of course bundle the equipment up, put it back in the car and take off and hopefully, hopefully spot another pothole. Well, we, we had some real disadvantages. I mean it just, simply getting to areas was difficult because roads were few and far between probably the main disadvantage was that we didn't have very good map coverage, certainly no aerial photographs and occasionally someone in town we'd be talking to them and they'd say oh, there's a lot of ducks out on such and so or we'd find out how to get there. Occasionally the aerial survey crews would drop us a note maybe or, or call us and, and tell us where there's some prospects for catching birds. But, there's some funny, funny experiences that come up trapping birds, up there because the population's low you never knew who owned what piece of ground a lot of it was Crown land, it wasn't always marked that way the private land, you didn't know who owned it or anything and

normally we, we would just go in and set up a trap and everything and I remember one morning it was about 10 in the morning and we set up a dry trap on a pothole, on the land, we didn't know who owned it or anything and we had the ducks almost ready to go into the trap and we closed the gate of course, always careful to do that if there's livestock around and gosh here came a, comes a fellow in a car, a truck and he drives through the gate and storms over there and I was able to wave him back because I was afraid he was going to disturb the birds and they might not go into their trap. So, he understood that much so he didn't interfere until we got the traps closed and then he got out and he staggered, staggered over to me and he said gee are you, you folks, you folks know whose land, whose land this is? And he was drunker then a skunk and I said no, I said no I don't know who owns this property. And he says, well he says, he says, it's my property, he says you don't have permission to be out here on my property. And I said yes we do, we have permission. And he straightened up and he said who gave you permission to be on the property here? And I said the Queen and he says, I can show you that and I pulled out my banding permit, which I carried with me personally. It was a Canadian banding permit and the letterhead of course in those days you know, it had the Queen's not logo but whatever you'd call it in the letterhead you know, it was a very official looking document you know and I said here, here's the permission from the Queen and he looks at it and he shook his head and he says, okay went back got in the car and drove away. But, but one more incident about the banding crews maybe but we'd stay in these hopefully we'd tried to find a little town that had a, had a hotel

in it. Well, the hotels were generally pretty old and sort of run down and we'd also hoped to find one that had, had a shower in it or a bathtub and hopefully, having found that hopefully they had hot water. Well, you take, you take a banding crew five guys that have been out there sweating and everyone badly in need of a shower or a bath or something obviously you run out of water. So, I mentioned Dave Harper from Illinois and Dave was the youngest of the crew so I guess that's why he bore the brunt of everything. But to begin with he used to ride with me and I'd, I'd put a, although I had a radio in the government car it was not, it was for official channels in Texas and so I couldn't pick up a --

(Tape change)

Yeah we are getting ready to take a bath and a shower knowing we are going to run out of hot water and such, oh no, wait we're back to Dave Harper because he is the, we'll get back to Dave in a minute. Anyway Dave would ride with me and I had another commercial radio, I could pick up a commercial radio station and invariably Dave would turn over, he'd crank up the, crank up the radio and he was real fan of a guy named Elvis Presley who I didn't know, I didn't know who he was until he died you know but Elvis was just coming into his own then and Dave was really into Elvis Presley music and he'd turn the thing up full (inaudible) you know and so anyway there after I said, I'd always say to Dave now, why, Dave why don't you ride in the other car here so we'd circulate around you know and have different people so we'd all get to know each other real good

and boy we did get to know everyone real good at the end of the summer but anyway I took car of the Elvis Presley problem that way. I always happened to have some other person riding with me. Well, back to the, back to needing a bath and a shower so we always knew we were going to run out of hot water so one of the fellows suggested, well, because Dave would, Dave would always beat us in there. He was really, he was real savvy that way you know, he'd go in and usually get the first shower and so somebody didn't think that was very democratic and so they set up a system of drawing short straws for, for the shower. Hopefully you'd get one shower, I mean one guy would get a shower maybe a second would but not all five or six and so anyway one of the crew members was handling the straws that we'd draw every time and it was the oddest thing because Dave would always draw the short straw, you know. Dave was always the last man for the shower and he never figured that out, never figured it out. Anyway at the end of about a month of banding waterfowl up there you know, you got to know your crew members really well and they're some wonderful people. We were all different of course and we had our own problems, and we had our own attributes and everything but, but we were, there was a real sense of camaraderie that developed and I think most of us kept in touch with each other in the years ahead. I know I did with most of my crew members and I bumped into them in many places there after.

Q Did you get any indication of band return? Were you part of that process like they are now? How successful was the banding thing and was it sort of reconfirming the flyways?

Yeah. Well, each, the leader of each banding crew held, held the master permit and we'd take turns doing different things like recording data and things like that and occasionally right at the end you know, I'd even say to one of the fellows I said well, I think I know where I'd put a trap on this, on this pothole but where would you put it? And occasionally we'd try it their way you know. But whatever, but because I held the master, the banding permit then I got the returns, or the reports of the, of the birds taken that year and the following years as long there's a bandable population still surviving so I, that really fascinated me but (inaudible) Pintails for example, ended up in the, in California, Grizzly Island, Sassoon marsh, the central valley of California. I know I got a report one time of, of a Pintail that had been shot by a fellow by the name of Lawrence Melkier, he doesn't' t mean anything to you probably, most of you. But Lawrence Melkier was a very famous opera tenor and evidently he's been shooting there and I sort of regretted you know, I had his address I sort of regretted that I didn't write back to him and try to determine what the circumstances were, whatever.

Q Were you getting compliance with returns? What percent?

Compliance, you mean out of the birds shot how many were actually reported by hunters? I should say that of course most of our banded recoveries were from hunters because that was the chief source of mortality and of course that's always been a big question in wildlife management over the years as to what proportion of the bird bands that people encounter maybe not necessarily shot them but find dead birds, whatever actually end up being reported to the bird banding laboratory and so there has been a number of band reporting studies done and the studies at least those I'm familiar with suggested perhaps a, a third of the banded, band recoveries were being reported at least in those days. Well, I, the Service has changed it's policies and procedures because in those days we didn't try unduly influence the reporting of bird bands because we didn't know how we could do it in a universal manner throughout all the hunters in north America for example and we could mount a publicity program in one place but not in another and then that would skew the data so that was the reason in those days that we didn't do that but since then there has been a change in philosophy and there's been efforts to promote the reporting of bird bands more uniformly and so we have some better fixes I think through placing reward bands on birds. In other words, if a person sends in a band that has a reward on it, they may get a monetary amount in return for it or some other kind of a prize or a gift.

Q Well, back to the, back to your career. Texas, up there in Saskatchewan banding.

Okay, well, wind down the work the Game management agents have done but when I tool the job I, I sort of thought that I'd probably not spend the whole full career in game management not that it wasn't interesting but I was interested in other aspects of, of waterfowl management research and in fact when I, even before I took the job Floyd Thompson told me, he says, you know, you know, he says what you need to do is to get your first job in an outfit and get some experience and things and then he says, opportunities will come up in other areas if you happened to be interested in those other areas and so I sort of followed Floyd on that and that's the way it evolved and so anyway I was, I'd always been interested in the prairie pothole county and I'd seen a lot of it of course through the three summer assignments in Canada but my first recollection of the prairie pothole country goes back to World War II days because I was in the Navy, I'd just finished up the great lakes and I asked to be detailed to Bermet in Washington to an aircraft carrier. I was on board a troop train, it was in late July 1945 and we took across, took off across on the troop train I think it was the northern Pacific and we went right through the heart of the prairie pothole country through north Dakota and I'd read about the prairie pothole country and everything but I'd never seen it and evidently 1945 was a wonderful waterfowl year because I can just remember the potholes were still brimmed full in mid summer and absolutely loaded with ducks, absolutely loaded. Unfortunately, we don't have any survey data to verify the impression I have of, of, of that situation but that was my first experience with the prairie pothole country. Well, anyway I, I learned that, while I was still a game management

agent in Texas that a brand new program was opening up in the Dakotas and the program related to the preservation of wetland or pothole habitat in, in the Dakotas and Minnesota in the US portion of the prairie pothole country and a friend that I'd gone to school with dropped me a note and he said you know, we've got a vacancy up here and he said maybe you'd like to apply for it and I got more information about it and I thought gee, that'd really be great, not that the experiences in Texas weren't great, I had some wonderful, wonderful times and days in Texas and everything but honest to God that heat and humidity down there and the no seeums and so forth I thought we were probably due for a change, my wife agreed with that, she'd been teaching school and everything and we thought probably we'd spent enough time in Texas so I applied for the job and I got it and it was stationed in Aberdeen, South Dakota and it was in what was called then the WHP project, this is wetland habitat preservation project, it was a new program that the service was just mounting and the reason for this was that at the same time one part of the government, the US Fish and Wildlife Service was interested in preserving waterfowl habitat on the breeding range another part of the government in the department of agriculture and in the ASC agricultural stabilization and conservation service in particular and the soil conservation service were engaged in a program that was headed exactly the opposite way to, to destroy wetland habitat. Well, this program had originated back in World War II as a means of increasing food production, the rational I guess being that by, by draining potholes and potholes have very rich soils that additional grain or other crops could be produced for the war effort and so the

government was subsidizing farmers to drain potholes. There were two parts, two so called conservation practices and one was called C-9, the C-9 which opened drainage in this case the farmer was partially reimbursed for --

So, the farmers were reimbursed to, to drain their potholes under the C-9 practice and C-10 related to drainage, draining potholes by the use of tiles. Tile was required for draining wetland in where the, where the rainfall precipitation seems to be higher, up in the prairie Johnny Lynch's bald open prairie of C-9 ditches did the same job cheaper. So, here we have these two, two parts of government operating at just opposite means. Well, this first came to light in I believe it was 1949 when Cory Shoenfeld wrote an article for Field and Stream, it was called "Goodbye Potholes" and Cory who was a journalism student at the University of Wisconsin, I never had the privilege of meeting him but he did this wonderful, wonderful article, came out in the field, he talked to, he talked to waterfowl biologist in the Fish and Wildlife Service, he talked to state biologists, he talked to the people in the department of Agriculture who were involved in the program and everything and he did a wonderful piece of investigative reporting and "Goodbye Potholes" is truly one of the most remarkable and important pieces of popular literature in the whole era of waterfowl management and research and I sometimes wonder how many waterfowl biologists have ever read, particularly waterfowl biologist today have ever read "Goodbye Potholes". So, in order to someway evaluate, better evaluate what is being done by the Department of Agriculture and to find means of offsetting it the Fish and Wildlife

Service set up the WHP project in region three out of Minneapolis and the program was under the division of river basin studies, they didn't know where else to put it that seemed to be the most likely outfit because it was an outfit that dealed with other Federal agencies particularly the Bureau of Reclamation and so when I arrived on the scene the program was being administered by Warren Nord in the regional office, he as head of river basin studies but under him was a fellow by the name of Burt Rouse and his deputy was Ray St Orrs I worked directly with, with Burt and Ray for seven years out of Aberdeen. Our field stations were called area, later became known as area acquisition offices and they were located in Devil's lake in North Dakota, Jamestown and Mynot in South Dakota we eventually had another office in, in Hyrum and in Minnesota the offices were in Fergus Falls and Benson. Grady Mann was in Fergus Falls and Clyde Oden in Jamestown and Blue Madden in Devil's Lake and George Jonco in Hyrum and those are the names that come to mind. So we were, we were essentially given a free hand. We were not told, you know how to do this job. We were expected to exercise whatever ingenuity we, we could to evaluate the situation and try to figure out some solutions to it. So in the beginning we would testify a great deal before different agricultural meetings where the various agricultural programs were being discussed. We'd point out that there is another side to this. You know, we're very concerned about the loss of wetlands and so forth and I think we made some headway there. We did a lot of publicity work, wrote a lot of articles, attended a lot of meetings promoting the value of wetlands and although waterfowl was the primary resource we were concerned about we,

we recognized and tried to lead other people to understand that wetlands had far other values too then waterfowl produced habitat for many other wildlife creatures and we thought they served some hydrological purpose in retaining water, not, not getting water off the land as fast as possible into the lower rivers such as the Red river of the north and Dakota and seems to have a flooding problem about every other year now and many of the rivers in Minnesota and in the upper Mississippi river generally to my mind I think a lot of this flooding could have been alleviated to a degree by retaining that water in a natural wetlands rather then having to drain it out. So the work in Aberdeen was fascinating we, the program shifted focus over the years to the point where we were able to offer something affirmative, positive to farmers in a way of actually purchasing or providing them with easements, easement payments if they would retain the wetlands in their present condition. So, if you travel through the Dakotas nowadays you'll see many. Many WPA signs, Wetland Prod, Wetland Preservation areas, Fish and Wildlife Service signs and these are areas that were evaluated and recommended for purchase by the Federal government and I did a great deal of that work in North, northeastern South Dakota. George Juncle did much of it in South, southeastern South Dakota and some of the people I named did it in North Dakota and in Minnesota. So, we had an incentive to for the farmers to consider some other use of the wetlands then, then draining them for crops and perhaps even more important then that I think was just raising the, the elevation of knowledge of the value of wetlands to the general public. At one time, well back in those days people had little appreciation of, of a wetland it was,

it was a place where you had to drive your tractor around and hopefully nit stick your tractor in it and I think was a, a pretty fair understanding nowadays nationwide that wetlands are indeed some of our most productive types of habitat and most threatened. So, we spent, Marilyn and I spent seven years in Aberdeen on the wetlands program and raised a family in, part of a family in the process there and the Aberdeen days were great days. We had some wonderful times there. I was very fortunate to share an office in Aberdeen with Jerry Stout, one of the old original flyway biologists and one of the most memorable people I can ever imagine meeting and there's only one Jerry Stout and we visited a great deal and I learned a great deal about wetlands in the Dakotas and also from Jerry's work in Canada. Ray Merty was also in the office for a while and he worked out of Northern Prairie Wildlife research center once it got set up. Well, enjoyed the days in Aberdeen a great deal and the habitat work a great deal but an opportunity came back to go back to Patuxent to work with Walt Crissy and his brand new deputy a fellow by the name of Dr. Al Guise. Al Guise was the statistician and one of the most, together they were among the most remarkable people I've ever met in my life and so, Al Guise came out to visit us in Minneapolis. Let me back up I missed a step. But going from Aberdeen had an opportunity to go into Minneapolis to the regional office back in the outfit I left in Texas and they had a job there that was called assistant regional supervisor technical and this is chiefly a biological job in a law enforcement outfit which sounds a little strange but law enforcement officers and game management agents are still being used for banding and surveys and everything up to that

time so there was a legitimate need there they participated in winter surveys and went to Canada and everything so it made sense in that respect and Art Hawkins at one time held that position and Art Hawkins was still in the Minneapolis office as Mississippi flyway biologist and so I viewed that as an opportunity to spend some time with Art and work with him and so that was also an incentive so I, so we moved to Minneapolis and ended up three years there and it was an extremely busy time I learned very little about Minneapolis or St. Paul because I was never there, I was always out in the field somewhere on some kind of a problem or survey or something. Those were exciting days in the Fish and Wildlife Service because new programs were being set up, the Morning dove surveys for example were being set up nationally in a new randomized manner and so I worked with that and the people beginning to get concerned about other species and waterfowl beside the morning dove, a wood cock for example. Some friends of Bob Burwell's the regional director then in Minneapolis. He called me into his office one day and he says, you know, I've got some friends and he says you know, they're, they're real avid wood cock hunters and they're concerned that we don't know much about wood cock and he says they tell me that we aught to have some kind of a workshop or something and pull together the few people in the United States that understand or know anything about woodcock and I wonder if you would do that, would you, would you represent me and work with the state of Minnesota and the University of Minnesota and help organize this woodcock gathering or something and I said sure, I'd be delighted to do that and so I got to meet a lot of people then, interesting people work with

wood cock and we had the first meeting at Long lake in Minnesota and every two to three years now there are still these woodcock workshops and they've gotten to be big, big affairs and they put out their own publication and everything and I think maybe we have some, we have some rough notes we may have Xeroxed or mimeographed back about the first one but, but that was the beginning of it. Well, anyway well, at in Minneapolis and working with surveys and everything I of course had contact with the people back in Patuxent with Walt Crissy and Al Guise and everything and so one day Al Guise came out and was visiting and he said, he said why don't you come back to Patuxent we'd like to have you come back there. He said we've got a lot of exciting things going on, going on back in Patuxent and there's some new programs that are getting underway. We have a position we've got we need to fill and so we talked about it, Marilyn and I and decided well, yeah perhaps and, and talked to other people and people said well, in your career you've got to spend a couple of years back in Washington you know for career development if nothing else but you know, spend your time back there a couple of years and then he says you go back in the field and everything. Well, it really doesn't work that way. So, I said well, well, Patuxent's not Washington DC, oh, that's alright experience is all the same. They count Patuxent is the same as experiencing Washington, DC, see? But --

Okay, we're back to Minneapolis again and the busy life there but one of the, one of the key problems during the three years in Minneapolis was Canada geese and particularly the Canada geese in the Mississippi valley population. These

are geese that breed up on the western side of Hudson Bay and they, they migrate down through Wisconsin and winter in Illinois, southern part of Illinois, crab orchard and Horseshoe lake area but this is a population it's been studied over the years on this, it's a population that attracts an awful lot of hunting pressure and wildlife populations tend to react to changes in the environment and as did the Canada Geese in the Horacan, around the refuge there that farmers planted more and more corn and geese learned how to capitalize on the corn to the extent of actually pulling it off, off the stocks. So, geese lingered in Wisconsin longer and longer periods of time and arrived in Illinois later and later and of course with more geese around for longer periods of time in Wisconsin the harvest of those geese kept mounting to the concern of, of, of Illinois and each of the states had a theoretical goose harvest quota that Wisconsin was only to have, have so many geese shot and as in Illinois and that this would be in line with population objections and no harvested, over harvest would occur. Well, over harvest occurred everywhere because there is no real mechanism for determining how many geese were being actually taken by the hunters so one of the jobs I had in Minneapolis was to set up some set of sort of an effective quota system and after many, many years of state efforts to try to give some meaning to the state quotas the decision was finally made for the Federal government to administer the goose harvest system in Wisconsin. We would, we would permit the, determine the number of permits and set up the mechanism and everything for the distribution of permits in cooperation with the Wisconsin Department of Fish and Game and this was done on a computer basis so it was really my first

experience in working with computers and, which was an eye opener and it was one of the earliest applications I believe to the use of computers in regulating harvest of waterfowl. Well, it wasn't a hundred percent ses, successful but it did, it did give a better control of, of insurance on the quotas then we'd had before but in the mean time with more and more geese at Horack and this cause more local problems, more concerned on the part of Illinois and other states that harvested these geese and everyone agreed that there is simply too many geese in Horacan and how to, how to lessen the number of geese and get them moving on their way down south and so I looked into other mechanisms in cooperation with other people as to how we could better disburse and reduce the number of geese and, and some places harassment or driving geese, physically driving them would lesson the attractiveness and that they'd eventually move onto other places so the Service made a, I say very reluctantly a decision to harass the geese at Horacan and so the Service mounted an all out program there by bringing in pilots, refuge pilots, flyway biologist pilots and gathering together propane cannons and other things that are used for harassing geese and well, we did cause quite a stir there I can assure you. A lot of geese got up in the air, a lot of them came back where they were, the program ran over probably over ten days the best I can recall. In the process of course, a lot of the Wisconsin goose hunters got concerned about this, driving geese away would lessen their opportunities to hunt geese not that they didn't have a lot of opportunity or more then their opportunity anyway, became a great big political hot potato and it was culminated then in the state of Wisconsin driving out, the Attorney General,

assistant Attorney General and several of his aids and other very, very important folks in Madison we were told came out in a caravan, served papers on the Fish and Wildlife Service people involved in the harassment program including myself and we were hauled down to Beaver Dam and made an appearance before a state judge down there. We were charged with harassing geese without the consent of the state of Wisconsin and of course Federal laws always take precedent, rules and regulations always take precedent over state regulations and everything so we, we recognize that nothing really was going to happen out of all this and it was a chiefly a publicity measure probably one that the state if they really new the details would be reluctant to participate in but anyway the harassment program ran on and I, I was responsible for writing an evaluation and report of the thing and I, I do not think it was very successful I think there were probably other mechanisms that could have been taken for it but at least we tried, tried something that hadn't been proven before, probably habitat lessening the attractiveness of the Horacon area from an agricultural standpoint would have been a far more important --

(Next tape)

Q You were writing a report about harassment and –

Yeah, and but, but you look at it from a practical standpoint you know, you tell farmers you're planting too much corn out here, you aught to cut back you corn

acreage in, you know half. You know, that's sort of, sort of a foulesy you see, we wildlife's drift into all the time. We look at a wildlife problem and we come up with a solution to it from the view point of wildlife and really there's not much consideration about all the other factors that relate to this ever becoming a practicality. I don't know how many times I've read research, you read research reports on and they propose something for the benefit for whatever the particular wildlife problem is and, and the thing is totally, totally unrealistic, it's dreaming on cloud nine but anyway back to the point. So, anyway the harassment program at Horkan and did draw a lot of attention, the everyone recognized that there was indeed a problem there and the states participated there after a lot better and enforcement other quotes. The overall end of it I think was positive in terms of benefit to the, to the resource. If you remember, now we're talking about 1966 I guess it was you know, we were in the Vietnam, Vietnam war then –

Q '64.

'64, okay, had begun at '64. No, I was in Horkan, we were in Minneapolis '65 though '67. Well, whatever it was. We were in war with, in Vietnam and the Milwaukee journal always had a great cartoon and I remember the one that shows, it shows LBJ at his desk and he has Secretary of Defense, Robert McNamara before him and on LBJ's desk is a globe of the world and it's turned around so that the United States is on view and right were Wisconsin would be there is a little puff of smoke going up and LBJ is looking at Bob McNamara and

he says, Bob how many troops can we sent to Horkan. I've got that in here somewhere. Well to close out the Horkan matter, about 5 months after all the harassment had ceased and every thing we got papers from the state of Wisconsin which officially, officially withdrew the charges against us for harassing geese in Wisconsin without state permit.

Q And then you went on to Patuxent?

Yeah, okay Patuxent. So, we're still in Minneapolis and Al Guise came out as a recruiting trip I guess because he wanted us to go back to the Patuxent and work with these new programs and everything. One of the new programs was called the accelerated research program and this was to benefit further research on the migratory game birds that weren't waterfowl. Over the years the great bulk of the Services attention, money and resources has always gone into waterfowl which is proper I think but on the other hand, other res, other species such as the mourning dove, woodcock snipe, fan tailed pigeon and so forth were being overlooked. The Service doing virtually little about these so, a group of concerned people including citizens and sportsman got together and prevailed upon Congress to make a special appropriation of I believe it was one point eight million dollars to further research on the non-waterfowl migratory game birds. We always have problems describing this group of birds, some people call them migratory upun and mig, upun and shore birds and different handles but we don't have a good designation for them so I'll just call them non-waterfowl although it is

a negative connotation so, so here the Service is, it's confronted with this brand new appropriate of one point eight million dollars and part of it was ear marked for research studies to be undertaken by the states and part of it to be done by the Fish and Wildlife Service and how, how do you distribute this, this pot of money in a useful and meaningful way so that was the job I got into upon getting back to Patuxent. My title was really Chief of Migratory shore up and game bird studies. But this is a big part of the job that first year and so, it meant a lot of meetings with people state and state people and Federal people and the various associations of state fish and game commissioners and the international association of so four from, so we laid out criteria as to the types of research that were needed and how interested states could apply for grants under the program and what the reporting requirements were and things of that sort and so that was quite interesting , it involved a lot of travel around the country and so we got the program off and running and it is still in existence but I don't believe it's funded very well or certainly not satisfactory at this point. So, after a while there working with, with Al, with Al Guise's and Walt Crissy's director for the migratory birds population station we were in Snowden Hall, this is where we are located and Snowden hall is, have you been to Patuxent? Alright, Snowden Hall is the old, the old plantation building. It's a single floor building, old brick colonial type building and do you know the story of Snowden? Snowden is now a two story building but if you look at the, look at the bricks on the outside of Snowden Hall you can see that the original building was one story and in other words, a second floor has been put on top of Snowden Hall and the story tell back there is that

when Mrs. Snowden moved out there to occupy the, this plantation she was very put out that the, well people of our standing don't live in single floor dwellings, you know you have to have a second floor if you're going to be anybody very important and so there upon a second floor was added to Snowden and if you visit Patuxent you can see where that change in roof line has been made. Anyway, we were extremely cramped because more and more people were being brought on board. Walt Crissy was devising all sorts of new programs, a parts collection survey for example, where hunters would send in duck wings or goose tails and techniques have been found by Sa, Sam Carnie and others working with him as to how to identify not only the species of bird of course from a wing, we're talking about ducks now but, but also the sex of it and in many cases also the age of it. So we're beginning to understand the population dynamics, have a little more background on this and let me say that I've never met anyone I don't think with the insight that Crissy had into what really makes the north American waterfowl duck resource click. He had amazing perspectives and he's innovative in how to, how to address those issues. He perfected the, the breeding ground surveys that the flyway biologists participate in now and the winter surveys and, and these new parts collects surveys. Also, a hunter harvest survey that was based upon a sampling of persons who buy duck stamps, so called duck stamps so that there is a nationwide randomized semi-randomized matter of gathering basic data on duck populations well, simply stated production of a resource has to equal that resources mortality, that is the bottom line of any wildlife population but involved in it of course or well how does mortality takes its

shape, what causes it? Is it controllable? Is there anything you can do about the thing and this responsibility is particularly important I think when we're talking about a, a mortality that is permitted by the Federal government namely hunting. So, we had a high obligation in that respect and Crissy had a wonderful insight into how these various pieces would fit together. In fact, I don't it's generally known but after Walt Crissy analyzed the population of fall flight and the regulations have been set every year he put together his estimate as to what the breeding population survey the following year would show and this was put into a sealed envelope and a copy was given to the director and I do not know of any accounting you know, the following year after the surveys have been taken as exactly how Crissy's estimates compared with, with what the survey data reflected. I've heard Walt talk about it on occasion that we missed it by two million Mallards or something in the breeding survey but there's always an explanation. There was always an explanation as to why it didn't come out you know, pretty much in line with his, his estimates but from what I know I think he, I think he must have been fairly close a lot of times in those estimates. I don't think that story's ever been told. And I've never seen, I've never seen his estimates and I don't know much more about it then what I've related.

Q It's a little more formal now, I mean we actually make projections now that are more public.

That's right you know, we never projected that the fall flight was going to be one hundred and ten million birds for example and people always ask that question and that was the most disturbing question to answer because well, we didn't have the mechanism for doing that but, but we have a much better insight into things nowadays I think. Well, anyway one of the exciting things at Patuxent was the advent of the computer and the computer arrived just, I think it was a matter of weeks if not months, I don't think it was months ago and it was an IBM 360 Model 20, it's a great thing, it's a great new machine we have over here. A fellow by the name of Manny Vearo was in charge of the, what we called the ADP section and the, the name was eventually changed to EDP, electronic data processing and some people would call it the eventual data processing section but before that everything was done, all the data were on punch cards, tons and tons and thousands of punch cards, tons of punch cards, drawers, boxes everywhere, punch cards everywhere you look were punch cards and so they were fed through the counter and then you'd have to resort them to find something else ungodly, ungodly mess you know to really try to process any amount of data, so the advent of the computer was really something special and there's another great thing that happened and we got these huge machines, they looked like suitcases and these were electronic calculators, they weighed about 70 or 80 pounds. The, I know, I know the gals in the office that often did the tabulation, they were too heavy for them to lift so whenever they wanted them moved, when they moved they'd always have to find a mail around somewhere to help them and these were great machines, these were Cathogreytubes and

you looked at this wonderful display of the figures up here and you could punch it, punch things into the keyboard and they'd change up here on the screen and it was just absolutely magnificent. Well, the problem was they did four things, they added, the subtracted, they divided and they multiplied. They did no other function. They did no more then today's hand held calc, not that much, not nearly that much, hand held calculator and back in those days a real problem, always a problem, was just the simple arathmatic error by, by doing all these calculations manually you always had to double check it and you have someone else double check. You know, does this string of numbers add up and everything? I mean that was an enormous, enormous handicap and the frightful thing is how many errors slipped by and lead to some consequential decision you know that really was wrong. I don't know of any first hand cases off hand but I'm sure there must have been some around. So, just going from mechanized calculations to, to the computer was something enormous not that computers don't make mistakes but the computer mistakes are mistakes made by humans working with the computer. It's nice to blame the computer but you dig a little deeper you're going to find a human hand behind it somewhere. Well, of course we found out shortly that the model 20 was not capable of handling the data we had it far exceeded that and we called in an IBM under contract and asked us to look at, to look at the system there at Patuxent and make recommendations and so IBM sent in a crew and they, they met with all the folks there, people in the banding office and people involved in the surveys and all the rest of it and they said you know, you people have one of the most complicated data systems we've

ever seen, said we just can't, we can just hardly comprehend the complexities of the, of the statistical problems that you're confronted with and, and trying to develop regulations for hunting waterfowl and other game birds, they were just absolutely astounded with the complexity of the program and everything. Well, fortunately the Fish and Wildlife Service and out group out there at Patuxent wasn't the only one that had problems with the computer and so this ended up with the Department of Interior setting up a computer system and they ended up with this huge, huge machine, it was an IBM 360 model 65 what ever that was, but it could do a great deal more then we could but, so we would send down jobs and they were on computer tapes, down to Interior, we had a courier, that was his main business would take these tapes down to Washington, DC and wait around while they process the jobs and everything and bring them back and of course when you are working in a big agency like that different agent, different parts of the agency have competing interests and needs. So, we're talking about priorities now and you're talking about expensive, high costs and so we'd usually run our jobs, the big jobs at night, it was a differential charge, you where they had to have it back the same day or whatever and so we'd try to economize by, by running our stuff in the evening, send it down in the afternoon by courier and pick it up the next morning and that was the way it was working when I left there and since then I don't know how many generations of computers the both the Patuxent and the Department of Interior have gone through but I'm sure it's very, very many but anyway it's fascinating in those days working with that sort of stuff.

I'd like to say a little bit about the division of management enforcement but it too evolved over the years, particularly that the emphasis became more towards law enforcement and less towards the management activities that their people would participate in the past. This has both it's good and bad aspects of course, you know, it probably made for a more sophisticated law enforcement, a concern was coming up about the endangered, endangered species and, and unlawful international trade and so there was a real need for a division of management enforcement or branch of management enforcement to change and so it eventually became the division of, of law enforcement and probably Clark Bavin the Chief was instrumental in that but the, but the professionalism of, of service enforcement officers became higher I think they were able to spend a much higher part of their time in true enforcement activities, these have been complicated by a number of things like I mentioned endangered species act and sitees and some of the other regulations that gave the Federal government more authority in terms of wildlife importation and preservation. Likewise, things changed from the management standpoint. Walt Crissy's migratory bird population station which I went to work under existed there at Patuxent for I'm guessing maybe 10 or 12 years and but we knew we saw changes there also and so eventually the name migratory bird population station was changed to the office of migratory bird management, it's located in Washington. Although Crissy was located at Patuxent he spent a great deal of time in Washington in meetings and things was quite unhandy at least in terms of the Washington people to have the migratory bird population people out there in the countryside, they wanted

them in closer. Also some of the legislation had changes, in the of setting regulations for example. We had to react to, to the impacts of the endangered species program. There became what is called section seven consultation, that before we can set up, establish the waterfowl regulations each year. We have to go into a consultation with their office of endangered species to determine that none of the actions that we are prosing to do in terms of hunting migratory game birds had any impact on any species that have been designated as threatened or endangered. Another change was NEPA, National Environmental Procedures Act. This set out the means by which the Federal government establishes regulations. It declares that the meetings will be open to the public, it will be advertised so that the public can attend. There's certain steps that require even after the regulations are proposed for people to, to respond and to evaluate them before the final regulations are promulgated. The whole series of things like this that, that came into being that greatly complicated the, the job of managing North American waterfowl and setting regulations and a lot of these had legal consequences so there's a, there's a justification for, for having sourcers at hand to review the various required documents, things of that sort. So, after Walt Crissy retired the office of migratory, migratory management, bird management under Dr. John Rogers was, was established and so John's office was moved down to the interior building and I stayed at Patuxent as, as his assistant for two or three years as I recall and eventually moved down to Washington myself and my job then was Chief of the branch of operations in the office of migratory bird management and in that job I had I suppose probably two primary

responsibilities, one was as a supervisor to the flyway representatives, I should say something about them but these are key people. One assigned to each of the four flyways, the Atlantic, Mississippi, central and pacific. These are the key people that represent the Fish and Wildlife Service in migratory bird matters and including the regulatory matters and that was a, an extremely simple job from my aspect because we had such competent people in those jobs, we had Ed Addy and, and Warren Byrondon and Jerry Saree in now in the Atlantic flyway position and we had, we had Art Hawkins and then Ken Gamble came along as the representative for the Mississippi flyway and then we had, in the central flyway we had Ray Bower and later Harvey Miller and in the Pacific flyway John Shatten who was followed by, by Jim Bartnick. These are all solid, competent people and the amount of supervision and problems that that part of the job entailed was pretty minimal. It was, we had a wonderful working relationship there I guess. And the second part of the job as chief officer of the branch of operations was the regulatory procedure and as enjoyable as the other part of the job was, this is just as much the opposite. A series of regulations and meetings and procedures and everything on a very, very tight budget, everything under stress. Once the biological data had been assembled and evaluated and made available to everyone then, then we had to begin a series of meetings in house and also meetings with the various flyway technical committees and flyway councils and public meetings require under NEPA and doing all the consultations under the endangered species act and it just, and meetings with the office of migra, of management and budget for example. I remember one year when a President

came in and his message was, we're going to abolish as many Federal regulations as we can. Let's get rid of them. So, in due time we got a message that we were due for a meeting with the office of management and budget because office of management and budget was proposing to eliminate the regulatory procedures and process for setting regulations. Little did they recognize that under the treaties that we had with Canada and Mexico and so forth, migratory birds, the designated migratory birds are totally protected. There's no taking of them. There are no seasons on them. There's no hunting permitted on them unless the Secretary of the Interior specifically provides for such taking. So, if the regulations were prohibited, withdrawn, no longer used anymore, this meant that that was the end of all migratory bird hunting in the United States as well as other permitted uses of the resource. So, we met over there with management, people in the office of management and budget and they started out real gung ho, yep we want to get rid of your regulations and so forth and it took a long, long time to explain to them that in truthfulness the migratory bird hunting regulations are permissive, they permit, permit the uses of these, of the resource for human. Without the regulations there would be no use of migratory birds. It was totally, they had a totally, they held the usual, they held the usual position with regard to most regulations which was right but ours was just the opposite and it took a long, long time to bring them around to the point to understand that and I, in fact, I remember one time some individual and I'm not going to name him or myself, said if you want to see pure hell, if you want to see pure hell, you shut the hunting seasons on migratory game birds. You may have

thought I said that but I, I'm not going to admit that. So, that was a very stressful job in setting the annual, helping set the annual hunting regulations understand I had no part in what most of the decisions were, those decisions were made elsewhere but I did handle the, pulling together the information for the Federal registry which is the Federal government official means of advising the public what it intends to do or is doing.

Q You wanted to talk about

Well, yeah I'd like to say, just some comments generally about the Directors, wonderful Directors we had back when I was working not to, not to negate the present ones because I don't know anything about them but we had some really dedicated professional people and there was Len Greenwalt and Dan Jansen and John Gachuck and I have got a real warm heart in, place in my heart for John Gachuck and I think a lot of Fish and Wildlife Service people do but was a true professional and he is, he accomplished so much, so much during the days that he was regional, regional director first in Boston and then director of the Fish and Wildlife service in Washington. I, he was a gentleman of the highest order and I don't think there are many employees that worked during his days that just wouldn't give their utmost to help John in any way possible but I think one of the things I remember about him most was when I was still under Minneapolis regional office and Dan Jansen had stepped down as regional director and we understood a new gentlemen by the name of John Gachuck at least he's new to

me but not to a lot of other people had been appointed director of the, of the Fish and Wildlife Service and we had noticed that he was going to be in the Minneapolis regional office next week, their regional director was Bob Burwell and Bob sent out a notice that he expected all employees that could possibly leave their job to spend part of the afternoon with John Gachuck during his visit and so we of course are anxious to meet the new director and so the meeting came off and John got up there and he says, folks he says, I know a lot of you and a lot of you I don't know but he said I'm John Gachuck and for better or worse he says, I'm, I'm your knew director but he said, you know you're not going to hear much from me about what I think our mission ought to be. He said I'll give a few words, some ideas and so forth but he said, I'm here chiefly to listen to you and so John spoke for 15 or 20 minutes and he stopped and he says now, he says I'm, I'm the listener, the floor is yours, and he said you can ask any question you want and I'll do my best to, to answer it and of course, he says, you know I can't, I won't be able to answer some of them because I don't know the answers to them yet but he said I want you to, I want to hear from you as to what you think our Fish and Wildlife should do. What are we doing good? Where can we make improvements? He said, he spoke a great deal about the responsibility, the great responsibility he felt as being director and the obligations that the Fish and Wildlife Service had and it was one if the most memorable occasions during the years I'm familiar with, with the Service was to have John out there that day. And John visited every regional office that week. He went from one to the other and he had exactly the same sort of meeting and I can tell

you that at the end of that week he had, he had the troops one thousand percent behind him. And John had a remarkable memory of facts and people and places and at that meeting I, I had the occasion to, after his meeting in Minneapolis I had the occasion to go up and visit briefly with him, with everyone else in the regional office and so a few months after that I transferred to Patuxent and Marilyn and I were unfamiliar with the DC area and everything but there was a big controversy going on about the location of, is was a super highway or interstate or something in Virginia and there was a lot of concern about it because this is going to go through not only an area of very expensive residences but their civil war trenches along the same site and one person in particular had a renowned azalea garden and the highway is to go right through, right through this particular property and so we read that, that anybody that wanted to could come out, come out and view this site where the highway was going to go and Marilyn and I thought well, let's run down there and look at this and look at the civil war trenches and everything and we pulled up there and looked around and walked back to get in our car and a car drove up, it was John Gachuck and his wife, Edith and John got out of the car walked over called me immediately, immediately by name and said I'd like you to meet my wife here and I've meet your wife and we exchanged greetings and everything but how possibly he could remember a name just coming out a group of hundreds of people and I was in the wrong place, why should I be there? Why should he be there? The circumstances just crazy but he had that wonderful, wonderful knack of connecting with people and he, and he had a wonderful sense of judgment and

making, making decisions of the most difficult kind that were probably the best that could be made under the circumstances.

Q John had a very competent staff I think.

That right he had total confidence in his people. You know, he'd recognize them as professionals and they gave him the very best professional guidance that they possibly could and being director is an extremely difficult job with political pressures from the hill and the President's office and so forth and, and John always stuck by his guns whatever he finally concluded was the right thing to do, that's what John Gachuck did.

Q Okay, Milt.

Okay, you know sometimes I'm asked, I'm asked the question well, gee what would you do different if, if you had to do it all over again and gosh, in all truthfulness I'm speaking of Fish and Wildlife days but also the, even the days in Idaho and everything and I, I just feel so, so privileged to have had the opportunity and oh, in a couple, several respects of course working, working with the resource and, and the work generally being so enjoyable and hopefully productive, you feel like maybe you've, you've accomplished a little bit anyway. I, at least that was the feeling back in the old days when individuals could make individual contributions and I recognize that circumstances make that quite

different now that you know, we're probably more grouped and specialist (inaudible) we tend to be more genoas we knew a lot of things about broad things and not to much about anything in particular and I suspect that today we're, we've become more specialized, more folks out here that know a great, great deal about little slivers of information but I, I wonder how it all fits together and I, I think, I'm not negating that in anyway but very specialized information like that I think has to be brought together, assimilated in and lead to some comprehensive overall objective or solution to problems and but personally working for the Fish and Wildlife Service has been so rewarding, it's given me the opportunity to meet so many fine people and friendships that have endured over the years and to visit many, many places I'd never gone to before and including foreign counties and foreign assignments and I, there's some things I guess, you know, I probably would have done a little bit different but by in large it's been an enormously satisfying career.

Q What are you proudest about? What's your legacy?

Professionally or what?

Q Professionally.

Well, there have been several things. I don't know which one would be, I'd single out maybe but I, I enjoyed the wetlands program a great deal because hopefully

the areas that were set aside, purchased will be something that will be held in perpetuity for, for the betterment for north American waterfowl. I, many, many of the research accomplishments folks, I'm not degrading what the accomplishments are but sometimes they don't seem to have enduring benefits maybe like something physical like a wetland out there. I enjoyed working with Graham Cooch of the Canadian Wildlife Service in apply satellite imagery for monitoring snow conditions on the breeding grounds of the arctic nesting and sub arctic nesting geese and Bob Monroe from the Wildlife group out of Patuxent was involved in that. He'd been doing some other use of satellite imagery for, for his studies and we got thinking about it that, what would these imageries, images show in terms of snow condition in the arctic we knew from experience that arctic nesting geese tend to go though years of boom and bust, they have great production years and they have poor production years or virtually no production years and a lot of that seemed to be, we thought oriented to, to the advent disappearance of snow at a, at a critical time in the biological aspect goose production. Were the breeding grounds clear of snow and ice at the time when the geese had to begin nesting because of the shortness of the season up there. There's a given time when they must begin if they're going to produce, incubate the eggs produce the eggs and rear them to flight stage. They themselves go through molt and be able to depart before another winter sets in on the arctic. Well, we knew quite a bit about, the Canadians in particular knew quite a bit about dates of when nesting should start in different areas and so we used some of those dates which generally arranged around June the 15th and so we ordered

satellite imagery through NASA and began to systematically look at some of the breeding, major breeding grounds on Hudson Bay and Banks Island and, and the Alaska coast and other places and of course we don't see geese on satellite pictures but we can tell whether the breeding grounds have got snow cover or not and so I think to some extent we were able to understand the years and predict the years when goose production was likely to be bad. We could never do the other aspect of it, how good would success be. We could never get to that point, you need ground truthing in order to make that sort of an adjustment but, but I think at that time it was sort of an exciting project to work on to be able to use satellite imagery for a very practical part of the north American goose management.